Delaware Department of Transportation
Division of Preconstruction
Design Guidance Memorandum
Office of Quality Assurance

Memorandum Number 1-3

1. Road Design Manual 2. Bridge Design Manual 3. Utilities Design Manual
4. Real Estate Manual 5. Standard Specifications 6. Standard Construction Details

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Title: Use of Guard Rail End Sections. Effective date: Oct. 1, 2001

Sections to Implement: X Road, X Bridge, X PMT, X Design Support, X Specification, ___ Utility, ___ Real Estate, X Quality Management, ____Other_____

I. Purpose:

To provide guidance for the selection of guardrail end sections .

II. Design Guidance:

1. Careful judgement should be used when deciding that guardrail placement is necessary in accordance with DelDOT Design Standards and Design Guidelines. If it is required to protect an obstruction within the clear zone, every reasonable attempt should be made to remove the obstruction to eliminate the need for guardrail.

2. The location and extent of the limits of the guardrail should conform to the Design Standards and Design Guidelines. In addition on curved segments the designer should evaluate the terminal points in the field to identify any need for additional extension due to sight line, topography, superelevation, etc.

3. When selecting the end section a buried end section should be the first choice. This requires the necessary distance from the roadway and the suitable topography (backslope). This end section treatment is Item 726002, buried end section and is shown on Standard Construction Drawing B-6. If the appropriate field condition cannot be met, continue to 4.

4. The next end section that will be considered is the flared Type 2 Attenuator. The distance from the road must be in accordance with the recommendation of the manufacturer and the grade must be suitable for this placement. This end section treatment is Item 720586 Guardrail End Treatment Attenecator, Type 2. If this section cannot be placed in accordance with the Standards, continue to 5.

5. As a last choice the Type 1 Attenuator, may be considered. The Attenuator assembly should be installed with a taper in accordance with the recommendations of the manufacturer. The taper is recommended to minimize crashes with the extruder head by snowplowers and errant vehicles. The taper should be specified on the plans. This end sections treatment is Item 720585, Guardrail End Treatment Attenceator Type 1.

III. Justification:

To reduce damage to end sections from vehicles. Reports have indicated that many guard rail end sections are damaged by vehicles. The Type 1 end section is expensive and the Department would like to reduce replacement costs. See the attached photos of Type 1 and 2 Attenuator.

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